AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A thin-film solar cell comprising:

a transparent conductive layer and a photoelectric conversion layer laminated in this order on a substrate,

wherein the photoelectric conversion layer comprises a p-i-n junction, and an i-layer of the p-i-n junction is made of a crystalline layer,

the transparent conductive layer is provided with a plurality of holes at its surface of the side of the photoelectric conversion layer, each of said holes having irregularities formed on its surface, [[and]]

wherein the holes are provided on the surface of the transparent conductive layer in an amount of from 0.5 to 2 holes per micro square meter, and

wherein a plurality of holes are formed on the surface of the substrate, each of said holes having irregularities formed on its surface.

2. (Canceled)

3. (Previously presented) A thin-film solar cell claimed in claim 1, wherein a diameter of each hole formed on the surface of the transparent conductive layer is in the

range of 200 nm to 2000 nm, the depth of each hole is in the range of 50 nm to 1200 nm and a difference in height between each irregularity formed on the surface of the respective hole is in the range of 10 nm to 300 nm.

4. (Previously presented) A thin-film solar cell claimed in claim 1, wherein additional irregularities are formed on the surface of the transparent conductive layer in areas between the holes of the transparent conductive layer, and a difference in height between each of said additional irregularities formed between the holes is in the range of 10 nm to 300 nm.

5. (Original) A thin-film solar cell claimed in claim 1, wherein the transparent conductive layer is made mainly of zinc oxide.

6. (Original) A thin-film solar cell claimed in claim 1, wherein the i-layer constituting the photoelectric conversion layer includes silicon or silicon alloy.

7. (Original) A thin-film solar cell claimed in claim 1, wherein the ratio I_{220}/I_{111} of the integral intensity of (220) X-ray diffraction to the integral intensity of (111) X-ray diffraction of the i-layer is 5 or more.

8. (Original) A thin-film solar cell claimed in claim 1, wherein the transparent conductive layer is oriented with respect to the substrate surface.

9. (Previously amended) A method of manufacturing the thin-film solar cell of claim 1, characterized in that a surface of the substrate and/or the transparent conductive layer is etched for forming said plurality of holes on the surface of the transparent conductive layer at the side of the photoelectric conversion layer.

10. (Previously amended) A method of manufacturing the thin-film solar cell of claim 1, characterized in that the transparent conductive layer is formed so as to have the plurality of holes on its surface, whereby said plurality of holes are provided on the surface of the transparent conductive layer at the side of the photoelectric conversion layer.

11. (Currently amended) A thin-film solar cell comprising:

two or more sets of a transparent conductive layer and a photoelectric conversion layer laminated in this order on a substrate,

wherein a plurality of holes are provided on a surface at a side of a first photoelectric conversion layer of a first transparent conductive layer that is the closest layer to the substrate as well as on a surface at a side of a second photoelectric conversion

layer of a second transparent conductive layer formed on the first transparent conductive layer, each of said holes having irregularities formed on its surface,

the photoelectric conversion layers each comprise a p-i-n junction, and an i-layer of the p-i-n junction of the first photoelectric conversion layer is made of an amorphous or a crystalline layer and the i-layer of each of the other photoelectric conversion layers is made of a crystalline layer, [[and]]

wherein, for at least one of the first and second conductive layers, the holes are provided on the surface of the transparent conductive layer in an amount of from 0.5 to 2 holes per micro square meter, and

wherein a plurality of holes are formed on the surface of the substrate, each of said holes having irregularities formed on its surface.

12. (Canceled)

13. (Previously presented) A thin-film solar cell claimed in Claim 11, wherein a diameter of each hole formed on the surface of the first and second transparent conductive layer is in the range of 200 nm to 2000 nm, the depth of each hole is in the range of 50 nm to 1200 nm and a difference in height between each irregularity formed on the surface of the respective hole is in the range of 10 nm to 300 nm.

14. (Original) A thin-film solar cell claimed in claim 11, wherein a difference in height between each irregularity formed on the surface of each hole provided on the surface of the second transparent conductive layer is smaller that that formed on the surface of each hole provided on the surface of the first transparent conductive layer.

15. (Previously presented) A thin-film solar cell claimed in claim 11, wherein additional irregularities are formed on the surface of the second transparent conductive layer between the holes of the second transparent conductive layer, and a difference in height between each of the additional irregularities formed on the surface of the second transparent conductive layer between the holes therein is in the range of 10 nm to 300 nm.

16. (Previously presented) A thin-film solar cell claimed in claim 11, wherein at least one of the transparent conductive layers is made mainly of zinc oxide.

17. (Previously presented) A thin-film solar cell claimed in claim 11, wherein the thickness of the photoelectric conversion layer including the amorphous i-layer is one to four times as large as the average height difference between each irregularity formed on the surface of each hole provided on the first transparent conductive layer.

18. (Previously presented) A thin-film solar cell claimed in claim 11, wherein the i-layer of at least one of the photoelectric conversion layers includes silicon or silicon alloy.

19. (Previously presented) A thin-film solar cell claimed in claim 11, wherein the ratio I_{220}/I_{111} of the integral intensity of (220) X-ray diffraction to the integral intensity of (111) X-ray diffraction of at least one of the crystalline i-layers is 5 or more.

20. (Original) A thin-film solar cell claimed in claim 11, wherein the first transparent conductive layer is oriented with respect to the substrate surface.

21. (Previously presented) A method of manufacturing the thin-film solar cell of claim 11, characterized in that a surface of at least one of the substrate, the first transparent conductive layer and the second transparent conductive layer is etched for forming said plurality of holes on the surface of the first transparent conductive layer and on the surface of a second transparent conductive layer.

22. (Previously presented) A method of manufacturing the thin-film solar cell of claim 11, characterized in that the first transparent conductive layer and/or the second transparent conductive layer is formed so as to have a plurality of holes on its surface,

whereby said plurality of holes are provided on the surface of the first transparent conductive layer and on the surface of the second transparent conductive layer.

23. (New) A thin-film solar cell comprising:

a transparent conductive layer and a photoelectric conversion layer laminated in this order on a substrate,

wherein the photoelectric conversion layer comprises a p-i-n junction, and an i-layer of the p-i-n junction is crystalline,

the transparent conductive layer is provided with a plurality of holes at its surface of the side of the photoelectric conversion layer, each of said holes having irregularities formed on its surface,

wherein the holes are provided on the surface of the transparent conductive layer in an amount of from 0.5 to 2 holes per micro square meter, and

wherein the ratio I_{220}/I_{111} of the integral intensity of (220) X-ray diffraction to the integral intensity of (111) X-ray diffraction of the i-layer is 5 or more.

24. (New) A thin-film solar cell comprising:

two or more sets of a transparent conductive layer and a photoelectric conversion layer laminated in this order on a substrate,

wherein a plurality of holes are provided on a surface at a side of a first photoelectric conversion layer of a first transparent conductive layer that is the closest

layer to the substrate as well as on a surface at a side of a second photoelectric conversion layer of a second transparent conductive layer formed on the first transparent conductive layer, each of said holes having irregularities formed on its surface,

the photoelectric conversion layers each comprise a p-i-n junction, and an i-layer of the p-i-n junction of the first photoelectric conversion layer is made of an amorphous or a crystalline layer and the i-layer of each of the other photoelectric conversion layers is made of a crystalline layer,

wherein, for at least one of the first and second conductive layers, the holes are provided on the surface of the transparent conductive layer in an amount of from 0.5 to 2 holes per micro square meter, and

wherein the ratio I_{220}/I_{111} of the integral intensity of (220) X-ray diffraction to the integral intensity of (111) X-ray diffraction of at least one of the crystalline i-layers is 5 or more.

25. (New) A thin-film solar cell claimed in claim 23, wherein a plurality of holes are formed on the surface of the substrate, each of said holes having irregularities formed on its surface.

26. (New) A thin-film solar cell claimed in claim 23, wherein a diameter of each hole formed on the surface of the transparent conductive layer is in the range of 200 nm to 2000 nm, the depth of each hole is in the range of 50 nm to 1200 nm and a difference

in height between each irregularity formed on the surface of the respective hole is in the range of 10 nm to 300 nm.

27. (New) A thin-film solar cell claimed in claim 23, wherein additional irregularities are formed on the surface of the transparent conductive layer in areas between the holes of the transparent conductive layer, and a difference in height between each of said additional irregularities formed between the holes is in the range of 10 nm to 300 nm.

28. (New) A thin-film solar cell claimed in claim 23, wherein the transparent conductive layer is made mainly of zinc oxide.

29. (New) A thin-film solar cell claimed in claim 23, wherein the i-layer includes silicon or silicon alloy.

30. (New) A thin-film solar cell claimed in claim 23, wherein the transparent conductive layer is oriented with respect to the substrate surface.

31. (New) A method of manufacturing the thin-film solar cell of claim 23, characterized in that a surface of the substrate and/or the transparent conductive layer is

etched for forming said plurality of holes on the surface of the transparent conductive layer at the side of the photoelectric conversion layer.

32. (New) A method of manufacturing the thin-film solar cell of claim 23, characterized in that the transparent conductive layer is formed so as to have the plurality of holes on its surface, whereby said plurality of holes are provided on the surface of the transparent conductive layer at the side of the photoelectric conversion layer.

33. (New) A thin-film solar cell claimed in claim 24, wherein a plurality of holes are formed on the surface of the substrate, each of said holes having irregularities formed on its surface.

34. (New) A thin-film solar cell claimed in claim 24, wherein a diameter of each hole formed on the surface of the first and second transparent conductive layer is in the range of 200 nm to 2000 nm, the depth of each hole is in the range of 50 nm to 1200 nm and a difference in height between each irregularity formed on the surface of the respective hole is in the range of 10 nm to 300 nm.

35. (New) A thin-film solar cell claimed in claim 24, wherein a difference in height between each irregularity formed on the surface of each hole provided on the

surface of the second transparent conductive layer is smaller that that formed on the surface of each hole provided on the surface of the first transparent conductive layer.

36. (New) A thin-film solar cell claimed in claim 24, wherein additional irregularities are formed on the surface of the second transparent conductive layer between the holes of the second transparent conductive layer, and a difference in height between each of the additional irregularities formed on the surface of the second transparent conductive layer between the holes therein is in the range of 10 nm to 300 nm.

37. (New) A thin-film solar cell claimed in claim 24, wherein at least one of the transparent conductive layers is made mainly of zinc oxide.

38. (New) A thin-film solar cell claimed in claim 24, wherein the thickness of the photoelectric conversion layer including the amorphous i-layer is one to four times as large as the average height difference between each irregularity formed on the surface of each hole provided on the first transparent conductive layer.

39. (New) A thin-film solar cell claimed in claim 24, wherein the i-layer of at least one of the photoelectric conversion layers includes silicon or silicon alloy.

40. (New) A thin-film solar cell claimed in claim 24, wherein the first transparent conductive layer is oriented with respect to the substrate surface.

41. (New) A method of manufacturing the thin-film solar cell of claim 24, characterized in that a surface of at least one of the substrate, the first transparent conductive layer and the second transparent conductive layer is etched for forming said plurality of holes on the surface of the first transparent conductive layer and on the surface of a second transparent conductive layer.

42. (New) A method of manufacturing the thin-film solar cell of claim 24, characterized in that the first transparent conductive layer and/or the second transparent conductive layer is formed so as to have a plurality of holes on its surface, whereby said plurality of holes are provided on the surface of the first transparent conductive layer and on the surface of the second transparent conductive layer.